Department of Botany and the U.S. National Herbarium

The Plant Press

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Department Profile

Algae You Never Knew Existed

By Robert DeFilipps

What do field naturalists and scientists call the obscurely known or unexplainable objects they sometimes encounter? According to John P. Wiley, Jr. (in *Smithsonian Magazine*), to the paleontologist they are "GKWs" (God knows whats), to the birder they are "LBJs" (little brown jobs), and to the botanist they are "DYCs" (damned yellow composites). James N. Norris, curator of the algal collection, is an industrial-strength taxonomist and ecologist of marine benthic macroalgae, yet even he is sometimes mystified by the true identity of certain red, green and brown algae (surprisingly, he uses the layman's term "seaweed" for them). However, he doesn't assign acronyms such as "GKWs"; he just keeps on resolving their relationships based on reproductive morphology and other factors, one species at a time. Sometimes the process results in solutions to mysteries that appear in his own previously generated literature.

Norris, with Diane and Mark Littler (Smithsonian algae colleagues) and his wife Katina E. Bucher (also an algologist), co-authored a field guide to the *Marine Plants of the Caribbean* (1989) which occur from Florida to Brazil. Despite the advantage of color photographs, two of the plants depicted in the book were so peculiar that they were referred to as "Unknown red alga" and "Mystery alga," respectively. The "Unknown" plants, which are pale pink, shapeless blobs when out of the water, but pleasantly branched entities when submerged, were subsequently studied in detail and published as the new species *Renauxia antillana* Fredericq & J. Norris, in the newly created family Rhodogorgonaceae. The "Mystery" plants of Belize, also with affinities originally not apparent at the family level, resemble pinkish-white gorgonian coral animals, but after intense scrutiny their identity was resolved into a new genus and species *Rhodogorgon carriebowensis* J. Norris & Bucher, also of the Rhodogorgonaceae. Calciferous cells present in the vegetative phase of this family are unique among algae.

> *"A species is a morphological hypothesis."*
>
> *-James Norris*

The 135 -gallon aquarium in his laboratory is a system for bringing poorly known seaweeds to light, and is presently inhabited by three new (undescribed) species of red *Gracilaria* camouflaged by darker pigments. Their tankmates are several brilliantly hued clownfish who seem to harmlessly nibble at random among the profusion of organisms. Interestingly, grazing fish can cause striking phenomena in other situations. Norris and Duke University colleagues have demonstrated that in wild Caribbean reef habitats, herbivory by parrotfish and surgeonfish nibbling on the brown alga *Padina jamaicensis* can create a plant which was misinterpreted by earlier workers as the genus *Dictyerpa*, and has numerous features which differ markedly from typical ungrazed plants of the same species. It almost seems as if the fish created a new species. Actually, the fish are regulating the morphological plasticity of the alga by stimulating the creation of prostrate, branched, turf-like, non-sexually reproductive, uncalcified plants with an unusual chemistry, as opposed to the, when ungrazed, typically erect, foliose, fan-shaped blades of sexually reproductive plants having a standard chemistry. The conclusion may be drawn that these algae are possibly strategically adapted through the actions of herbivory to persist in grazed habitats while maintaining the ability to respond rapidly to fluctuations in the abundance of hungry fish. The situation is reminiscent of terrestrial grasslands where herbivory is one factor strongly affecting phenotypic expression of plant morphology. No wonder Norris sometimes says: "If you want a new genus, just add fish."

He also likes to say: "A species is a morphological hypothesis." In combination with RBCL analyses of genetic relatedness via chloroplast genes, Norris is presently studying the comparative morphology, anatomy and systematics of the red algal family Deliceriaceae. Beginning with the concept of the genus and species as a morphological hypoth-

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New Faces

Gary Krupnick, former post-doctoral fellow in integrative plant biology at Pennsylvania State University, has joined the department as head of the Plant Conservation Unit. His previous research focused on the ecology and physiology of plant reproductive biology and plant-insect interactions. Krupnick has examined the sex expression of two different species, the California shrub *Isomeris arborea* (Capparaceae) and the wild progenitor of zucchini, *Cucurbita texana* (Cucurbitaceae). He has also investigated the interaction between herbivory and pollination, and the effects of endogenous ethylene production on plant reproduction. Originally from southern California, he received his Ph.D. from the University of California, Irvine and a B.A. from University of California, San Diego.

Dawn Dubois is the new secretary (office assistant) to the chairman. Formerly at the Uniformed Services University of the Health Sciences, Herbert School of Medicine, Department of Anesthesiology (Bethesda, Maryland), Dubois was secretary to the department chair**,** administrative officer and faculty. The university is a branch of the Department of Defense. DuBois is also working towards a B.S. in natural resources management at the University of Maryland.

Formerly in the Department of Paleobiology, **Walter H. Adey** has become a curator of botany. Adey brings to the U.S. National Herbarium a very significant, comprehensive collection of marine coralline algae specimens gathered from around the world. His research laboratory will remain in Paleobiology.

Alejandra Jaramillo, a graduate student from Duke University, who is studying the molecular systematics and morphology of the genus *Piper*, and **Judy Skog,** on sabbatical from George Mason University, who is working with **Elizabeth Zimmer** and Scott Wing (Department of Paleobiology) on "early modern fern families," are new members of the Laboratory of Molecular Systematics at the Museum Support Center and the Department of Botany.

Travel

Linda Hollenberg and **Susan Richardson** (7/26) traveled to Darlington, Maryland to visit the Clyde Reed Herbarium.

Robert DeFilipps (8/18) traveled to Lehman College, Bronx, New York to participate as a member of the examining committee for the dissertation defense of Suroojnauth Tiwari, on ethnobotany of the Patamona Indians of Guyana and to Dominica (8/27-9/5) to plant *Phenakospermum* and *Ravenala* at his Rosalie pandanetum. Seedling *Corypha* palms were obtained from Roseau Botanic Garden for similar purposes.

W. John Kress (9/22-9/24) traveled to Miami, Florida to attend a meeting of the coordinating committee of the Coalition for Excellence in Tropical Biology.

Visitors

Jacques Cayouette, Agriculture and Agri-Food Canada (DAO); Grasses (July 1-Sept. 1)

Alejandro F. Rojas, INBIO, Costa Rica; Pteridophytes (Aug. 17-30)

Martin Cheek, Royal Botanic Gardens, Kew; Sterculiaceae, *Nepenthes*, Meliaceae (Sept. 27-Oct. 29)

Leticia Pacheco, Universidad Autónoma Metropolitana-Iztapalapa, Mexico; *Callipteris* ferns (Oct. 8-13)

Alexander Berg, Universität Goettingen, Germany; Venezuelan paramo plants (Oct. 11-22)

Lucia Vasquez, Bailey Hortorium, Cornell University; Fagaceae (October 11-15)

Nyree Conard, New York Botanical Garden, Bronx ; *Artocarpus* (Moraceae) (Oct. 12)

Mary Barliworth, Utah State University; *Stipa*, *Nasella* (Poaceae) (Oct. 16-23)

Gerardo Aymard, UNELLEZ (PORT), Venezuela; Polygalaceae (Nov. 7-17)

John Pipoly, Botanical Research Institute of Texas, Fort Worth; Myrsinaceae, Clusiaceae (Nov. 29-Dec. 19)

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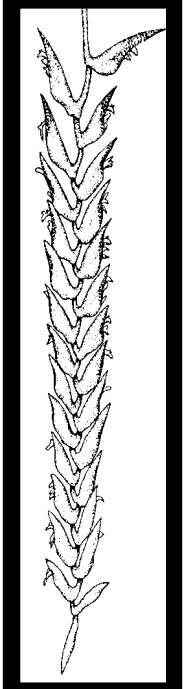
Wonder Drugs from Healing Herbs?

Chair With A View — W. John Kress



What would come to your mind if asked to name some of the most publicized drugs available today? Would you list some of the man-made and legally prescribed drugs, such as Prozac and Viagra? Or would you list some of the plant-based and over-the-counter drugs, such as aspirin? You might think of such drugs as marijuana, cocaine, and heroin, the plant-based but illegal drugs that we read about in the newspaper every day. We have come to an interesting intersection of the acceptance and rejection of substances we call "drugs" that have originated from various sources: either directly from the chemists, directly from the plants, or indirectly from the plants through the chemists. For reasons that are not always clear, these drugs have been either embraced or outlawed by our society. We are in the midst of considerable debate about the benefits, costs and property rights of plant-based medicines and agricultural products, so it is fitting to consider the current status of drugs on the world's markets.

Many conservationists have justified the preservation of the remaining pristine forests of the world, both tropical and temperate, as treasure troves of potential drugs and medicines of future benefit to society. Although there is a long history of the use of herbals for healing, surprisingly few major medicines derived directly from plants have actually reached legal commercial markets over the last 20 years. The Pacific yew from the American Northwest and the rosy periwinkle from Madagascar are the two most commonly cited examples of plant species yielding substances of great medicinal value. On the other hand numerous herbals, such as ginkgo, echinacea, St. John's wort, ginseng, and valerian, together comprise a multi-million dollar industry of home remedies and cures. Many pharmaceutical houses are searching for these potential marketable plant medicinals around the world. As taxonomists and specialists on plant diversity we can provide invaluable information on the identification of these species, and even determine their botanical relatives with potentially far greater potency and value.

However, it is clear that the value of a particular plant species as a drug is not simply based on its effect as a potent cure for a disease or ailment. The value of a drug to society, either plant-based or man-made, is derived from a complex interaction of historical milieu, cultural prejudice, and economic climate. A recent essay in the *New York Times Magazine* (M. Pollan, 12 September 1999, pp. 27-28) addressed the paradox of explaining the "taxonomy of chemicals" underpinning the use and acceptance of drugs. Neither safety nor addictiveness, neither disease-related nor pleasure-related, neither naturalness nor artificiality, are criteria that are employed uniformly in evaluating the benefit of a drug to society. It is obvious that drugs of both positive and negative effects are prevalent throughout our society, and that the legality and cost is not always correlated with these good or bad traits. Tobacco (*Nicotiana tabacum*) is an obvious example of an addictive but legal plant product that is a proven health hazard. An opposite and less obvious case is the attempt in Yemen to outlaw, without even a cursory study of its medicinal and cultural worth, the chewing of khat leaves (*Catha edulis*), which contain a stimulant similar to coffee and tea and has been an important element of the social fabric of the Arabian Peninsula for centuries.

Some plant-based but illegal drugs that are today considered very destructive to both the individual and society were initially accepted as medicinals of great value when first introduced. This chronology is true of *Papaver somniferum* (from which opium and heroin are derived) and *Erythroxylon coca* (from which cocaine is derived). The products of these plant species were introduced into American and European culture as potent and beneficial tonics or prescribed medicines at the turn of the last Century. They are both now considered highly addictive and dangerous, and form the basis of an international illegal trading cartel. Andrew Weil has correctly pointed out that the medicinal and cultural character of these plant species radically changed as their active ingredients were isolated, purified, and marketed. *Cannabis sativa* (marijuana) also has had a bumpy career with respect to its rejection or acceptance as either a recreational drug of destructive nature, or a drug with potentially significant therapeutic value (as I write its status seems again to be changing). Although the debate rages over who owns the intellectual property rights of new plant species with potential drug value, and hence market value, no one is claiming the rights to these illegal drugs despite the multi-billion dollar black market they represent.

Predicting the ultimate value of any drug, be it plant-based or man-made, is not a trivial matter. And predicting the eventual use, either good or bad, of any product derived from a plant species is also a difficult task. It is an important lesson for us that some of the most powerful and potent plant products that are outlawed in today's society have been rejected because of their abuse or as a result of a misunderstanding of the natural properties for which they were originally used. As we scour the planet for new drugs and medicines derived from plants, we must keep in mind that our discoveries may have a future that is very different from our original intentions.

Staff Research

Warren L. Wagner (PI) and Molly Nepokroeff, with **Elizabeth A. Zimmer**, and Ann K. Sakai and Stephen G. Weller, both University of California, Irvine (Co-PI's) recently were awarded a Smithsonian Scholarly Studies Grant for a study entitled "A Phylogeny of Subfamily Alsinoideae (Caryophyllaceae) and the Origin of a Divergent Hawaiian Lineage" ($68,000 for two years). The funds will support a two year post-doctoral position for Molly Nepokroeff.

They will work on the endemic Hawaiian genera *Schiedea and Alsinidendron* (Caryophyllaceae:Alsinoideae), which consist of 33 species. Since 1987, the Hawaiian Alsinoideae have been the subject of intense morphological and molecular studies to better understand the role of selection pressures in the evolution of dioecy (i.e., separate male and female plants) on islands using the historical perspective provided by phylogenetic analysis. The proposed molecular phylogenetic studies represent the first to explicitly address traditional relationships within the Caryophyllaceae and will provide the necessary framework for examining the systematic utility of characters used in traditional classifications of the Alsinoideae and Caryophyllaceae.

On September 13-17, Wagner went on a short trip to Coahuila, Mexico with Tom Wendt, Jim Hendrickson, David Riskind, Jose Angel Villarreal, and Miquel Carranza. He collected a new species of *Oenothera* from Rincon de Maria, which differs in a number of ways from *O.muelleri* Munz, which occurs to the south in Nuevo Leon. He will name it in honor of David Riskind (director of Natural Resources of Texas Parks and Wildlife), who initiated the original two (and only two) prior collecting trips to this part of the Santa Rosa range. While at the University of Texas on the final day of the trip Wagner studied material in TEX and LL collected over the past 20 years. Considerable progress has been made over the past two decades by Texan and Mexican botanists in this very undercollected region. Among the collections was a fragmentary specimen of another plant that is similar to O. *muelleri* that appears to represent yet another new species from the mountains near Saltillo, Mexico. During the trip Villarreal mentioned to Wagner that he collected *O. macrocarpa* in Coahuila, which was quite a surprise for a species known only from the Great Plains region of the U.S. Wagner's group found another population of this species near the entrance to the Rincon de Maria area. It is similar to a narrow-leaved *O. macrocarpa* subsp. *incana*. It seems that this represents another of the shared species between Coahuila and the Edwards Plateau of Texas.

Robert Faden flew to Boston on July 1 to examine plant specimens with a Philips XL30 ESEM environmental scanning electron microscope. He took two Commelinaceae plants from the research greenhouse *(Murdannia graminea* from Australia and *Tinantia pringlei* from Mexico) to test the capability of this SEM to examine fresh, uncoated specimens. He was able to examine and successfully photograph delicate floral parts using a cold stage and 100% relative humidity. Faden showed his SEM photos to the Natural History Museum's SEM Committee, which decided to recommend this model SEM as the museum's next SEM purchase.

Faden gave a talk entitled, "The 1996 Royal Botanic Gardens, Kew Expedition to Southern Tanzania," to the Cactus and Succulent Society of Maryland on September 4 at the Cylburn Arboretum in Baltimore. On August 25-27 he attended the 3rd Symposium on the Flora of Ethiopia and Eritrea, held in Copenhagen, Denmark and delivered an invited paper, entitled "The Commelinaceae of Northeast Tropical Africa (Eritrea, Ethiopia, Djibouti, Somalia and Kenya): Diversity and Phytogeography."

Robert Soreng conducted field work in the Arctic for the first three weeks in August. He joined Lynn Gillespie and Laurie Consaul of the Canadian Museum of Nature in a research expedition to the Canadian Arctic Islands, in the new territory of Nunavut, to gather materials for studies of taxonomic problems and hybrids in *Poa* and *Puccinellia.* Collections were made from Axil Hedberg, Baffin, Cornwallis, Devon, and Ellesmere islands, from 62 ° to 81 ° N. *Pucciphippsia vacillans* was found in five locations on four different islands where *Puccinellia vahliana* and *Phippsia algida* occurred. No trees were encountered other than 40 million year old *Metasequoia, Picea, Pinus* and *Larix* stumps at 80 ° N in the Geodetic Hills of Axil Hedberg Island.

Elizabeth Zimmer visited the Department of Botany at the University of Hawaii and served on Susan Grose's thesis committee. She then went to the Big Island with Sterling Keeley to visit the new University of Hawaii field station in Hakala, funded by a grant to Becky Cann and Lenny Freed. On her return, she stopped in California to meet with colleagues at the Huntington and Rancho Santa Ana Botanical Gardens.

Zimmer appeared on the Discovery Science Channel's SCIENCE LIVE program on September 15, where she answered questions on the topic of "DNA and the Woolly Mammoth." The program can be viewed on the Internet by visiting "www.science.discovery.com" and checking the archives of past shows.

Maria Faust was recently invited by the Finnish Institute of Marine Research to collect dinoflagellate assemblages in coastal marine waters of the Tvarminne Archipelago of the Baltic Sea, southwestern Finland, and the Aland lslands Archipelago. She was a guest from August 7-24 at the Tvarminne Zoological Station of the University of Helsinki.

Laurence Dorr presented a lecture on "Plant Collectors in Madagascar and the Comoro Islands" to the 807th meeting of the Botanical Society of Washington, on October 5.

Stanwyn Shetler continues to edit the translations of the final volumes of the *Flora of the USSR*. Volumes 22, 25 and 27 have been published, and vol. 23 should appear soon. The galleys of vols. 26 and 28 have been edited; page proofs of vol. 29 are being reviewed, and editing of the galleys of vol. 30 has begun. Shetler and **Sylvia Orli** are nearing completion of Part

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Research

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1, "Ferns, Fern Allies, Gymnosperms and Dicotyledons," of their *Annotated Checklist of the Plants of the Washington-Baltimore Area*. In this connection, Shetler recently reviewed Elizabeth Wells' collection of 250 plants from her study of plant recovery after flooding on Plummers Island in the Potomac River.

W. John Kress and **Michael Bordelon** traveled to Burma in July to continue their field work on the plants of that country. Kyle Williams, a graduate student in the Botany Department at Duke University, accompanied them to initiate his work on the systematics and phylogeny of the genus *Globba* (Zingiberaceae). Kress stopped in Honolulu on the way to Southeast Asia to participate in the board of directors meeting of the Heliconia Society International held at the Lyon Arboretum. He collected tissue samples from the outstanding collections of Marantaceae and Zingiberaceae in the arboretum for molecular systematics investigations of the two families that he is conducting with **Linda Prince**.

In Burma, the team met with colleagues of the Division of Wildlife Sanctuaries and the Forest Research Institute and collected in the Bago Yoma as well as the southern range of the Chin Hills near the Schwesettaw Wildlife Sanctuary. Afterwards, they traveled north to Mt. Popa, then east to Mandalay and Pyin-Oo-Lwin Botanical Garden and western Shan State. Progress continues on the gingers of Burma, but the most exciting news was the discussions with the Ministry of Forests on the development of a new Myanmar Center for Botanical Research at Pyin-Oo-Lwin.

W. John Kress and **Alice Tangerini** were interviewed for an article in *BioScience* on the technique and qualities of botanical art and scientific illustration. Included in the article is a drawing by Tangerini of *Stromanthe stromanthoides* (Marantaceae), an account by Kress of the utility of Margaret Mee's drawings in rediscovering a new variety of Venezuelan *Heliconia chartacea*, and a discussion of on-line botanical illustration which includes the Smithsonian Catalog of Botanical Illustrations developed in the department.

Herbarium Compactorization Update

The U.S. National Herbarium will be compactorizing two sections of the herbarium from approximately Sept. 1999-Feb. 2000. The two sections are: Bay #3 Poaceae (*Cordochloa- Spinifex*) (Alphabetically arranged); and Bay #8 Fabaceae (3766 *Astragalus*-Euphorbiaceae 4407 *Acalypha*) (Phylogenetically arranged according to Engler). Other areas of the 4th floor (Cycadaceae-Quiinaceae) may be blocked for staging. It is critical that everyone notify the U.S. National Herbarium in advance when planning a visit to ensure that the collections needed for study will be accessible. Loans will continue to be processed, but depending on the group, could be delayed. Type specimens will be unaffected. Any questions, or notice of visitation, should be directed to **Rusty Russell** (russellr@nmnh.si.edu) or **Deborah Bell** (belld@nmnh.si.edu).

(by Deborah Bell)

Plant Image Collection Started

The department has begun to create a unified Plant Image Collection (PIC) for use by scientists, educators, and the general public. Image resources representing the 4.6 million plant specimens and other botanical assets in the department and U.S. National Herbarium include photographs, electron micrographs, 35mm slides, scientific illustrations, and original botanical art. It is planned to digitize the herbarium specimen collection, beginning with the 90,000 specimens in the Type Collection, which constitute a virtual "bureau of standards" for plant nomenclature. The Type Collection contains specimens of great historical importance, including collections from the Wilkes Expedition (1838-1842), Mexican Boundary Survey (1854-1855), California Geological Survey (1860-1867), and Colombia Cinchona Mission (1940-1945).

In 1998 a pilot project to database all of the more than 3,000 scientific illustrations and botanical art in the department was finished. With support from the Atherton Seidell Endowment Fund, approximately 500 illustrations representing three selected families (Bromeliaceae, Cactaceae and Melastomataceae) were digitized and made available on the department's home page (http://www.nmnh.si.edu/botany). In addition, with support from the Women's Committee, over 3,600 photographic slides of plant species and plant habitats were assembled and committed to Photo-CD. These activities have created not only a useful information resource for research purposes, but a quality tool for professional collections management.

(*by George. F. Russell)*

Collections

Selected Collections Statistics, January 1 - September 30, 1999

	Transactions	Specimens
Acquisitions- (incoming)		
Open exchange	56	5,138
Gifts	137	7,615
Collected for museum	13	1,310
Disposals- (outgoing)		
Open exchange	132	10,578
Gifts	67	2,350
Forwarding	12	3,455
Return to Owner	20	399
Borrows-(incoming)	130	6,116
Loans-(outgoing)	246	19,458
Totals	**813**	**56,419**

(by Chris Tuccinardi & Deborah Bell)

George Proctor Returns to Jamaica

Since the era of Ignatius Urban (1848-1931) and his masterwork, the nine-volume *Symbolae Antillanae* (1898-1925), geographically broad taxonomic coverage of the West Indian flora has essentially been the province of four contemporaneous Atlantes, the pillars of Flora's Caribbean temple. These botanists are: Enrique Liogier (Brother Alain, born 1916); Richard A. Howard (b. 1917); C. Dennis Adams (b. 1920); and George Richardson ("Dick") Proctor (b. 1920). Proctor recently concluded a 16-month visit to the department, as a senior research fellow on a Mellon Foundation grant, during which he prepared an account of the monocotyledons of Puerto Rico and the Virgin Islands (except Orchidaceae), the summation of 12 years of intensive field and herbarium work. His stay was arranged and hosted by Pedro Acevedo, who will be contributing the vining aroids, Smilacaceae and Dioscoreaceae for the volume; other collaborating staff will work on the non-bamboo grasses (P. Peterson), sedges (M. Strong), and pandans (R. DeFilipps).

At this juncture in the history of Caribbean floristics, Proctor is unique: the only member of the above-mentioned "Four Horsemen" of West Indian taxonomy who currently resides on a West Indian island (Jamaica). He also demonstrates the rarely encountered ability to pursue both the pteridophytes and the angiosperms, while most taxonomists choose to concentrate on either ferns or flowering plants, one to the exclusion of the other.

Proctor was early inspired by William R. Maxon, curator of plants and a fern specialist at the Smithsonian, who published the young pteridologist's articles in the *American Fern Journal*. Maxon unfortunately died in 1948 before completing a book on the ferns of Jamaica, leaving a gap in Caribbean literature which Proctor later filled. Since the Catherwood Expedition of 1948 (see below), Proctor has had a firm home base as botanist, sometime head of the natural history division, and developer of the herbarium at the Institute of Jamaica (Kingston) from 1951-1980, followed by employment as herbarium supervisor at the National Botanical Garden in Santo

Domingo, Dominican Republic (1982-1983), and as a natural resources biologist and establisher of the herbarium (Herbario George R. Proctor) at the Department of Natural and Environmental Resources, government of the Commonwealth of Puerto Rico, San Juan (1983-1998). An inventory of the more than 55 West Indian islands where he has collected plants would include the bizarrely named Ginger, George Dog and Fallen Jerusalem, while Central and South America have been destinations as well. Over 55,000 specimens have been collected to date, and his herbarium studies have involved periods of London and European research concentrating on the historical Jamaican collections of Olof Swartz and Sir Hans Sloane.

A Bostonian by birth, and descendant of original *Mayflower* people including the John Proctor of "The Crucible" (a 1729 portrait of ancestor George Proctor, bearing an exact likeness to the living one, hangs in Langley Hall, County of Norfolk, England), he counts among his relatives two distant cousins of New England origin and botanical repute: Robert F. Thorne (coincidentally born on the same day as Proctor: July 13, 1920) linked through the Folger family; and Lyman B. Smith through the Lyman family.

In the early days, diminished funding for continuation of his 1945-1947 graduate studies towards a Ph.D. at the University of Pennsylvania led Proctor to become an herbarium assistant and research associate at the Academy of Natural Sciences, Philadelphia (1946-1947), following which he received the job of botanist to accompany the Catherwood-Chaplin West Indies Expedition (Cuba, Cayman Islands, San Andres y Providencia, Colombia) in 1948. After the expedition, a period of research and field work on Jamaican ferns at the Institute of Jamaica in 1949-1951, supported by the Institute and the American Philosophical Society, paved the way for his prodigious efforts to continue throughout the Indies. An Honorary Doctorate of Humanities degree was conferred upon him by Florida International University, Miami in 1978, and his numerous awards include the Special Gold Musgrave Medal (1976) of the Institute of Jamaica; the Order of Distinction (Officer) of the Government of Jamaica (1976); and the Centenary Medal of the Institute of Jamaica (1980). Somewhere he found time to marry twice and enjoy a family of six children (including three adopted), which has geometrically increased over the years into nearly 20 grandchildren and great grandchildren scattered from Boston and New York to Australia.

Approximately 28 plants have been named for Proctor, including species from the Bahamas, Belize, Cayman Islands, Guatemala, Jamaica, Nicaragua, Puerto Rico, and St. Lucia; among them is the palm *Coccothrinax proctorii* Read (1980), the national tree of the Cayman Islands. The dimensionality of Proctor's output is indicated by major publications such as: Monocotyledones in *Flora of Barbados*; Bromeliaceae, Myrtaceae, and Melastomataceae in *Flowering Plants of Jamaica*; the Pteridophytes volume in *Flora of the Lesser Antilles*; *Flora of the Cayman Islands*; *Ferns of Jamaica*; and *Ferns of Puerto Rico and the Virgin Islands*.

What has Proctor done to fill in his spare time over the years? He attended the Hollywood opening of Disney's *Fantasia* in 1940's Los Angeles; he was location consultant for simulating the Congo in Jamaica for *Dark of the Sun*, a film starring Rod Taylor and Yvette Mimieux (1968); he was presented to Queen Elizabeth and Prince Philip on their visit to the Cayman

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The Cornered Curator: Dan H. Nicolson

[*Editor's Note*: This is the first in a series of columns which will afford the curators of the Department of Botany an opportunity to discourse on their candid opinions, perhaps to critique and prognosticate, regarding the trends and state-of-the-art in their field of specialization. Dan H. Nicolson suggested the name "Cornered Curator", and as a gesture of gratitude we cornered him into providing the first installment.]

The 16th International Botanical Congress was a major one-week event (August 1-7) with nearly 5,000 registrants. A one-week meeting (July 26-30) of the Nomenclature Section preceded it with 300 attendees, probably an all-time record. About a dozen members of the department attended both. Some years ago I had some correspondence with Bob Ross (BM, ret.) about his recollections of his first Botanical Congress, the 1950 Congress in Stockholm. He commented that he especially enjoyed the Nomenclature Section, even more than the Congress meetings in his specialty (diatoms), because of all the passions and emotions on display. This meeting of the Nomenclature Section was as passionate and full of emotion as ever, if not more so. Alas, I saw less of this meeting than others (my first was the 1959 Montreal Congress, which was part of our honeymoon) because of duties connected with Committee work, such as the Nominating Committee.

There were three major nomenclatural issues: Names in Current Use (NCU), Registration, and the BioCode. All three were dismissed with such finality that I feel that we begin the new millennium with a backward-looking Code rather than a forwarding-looking one. I suspect that a new generation will re-invent what was summarily dismissed.

Why?

The computer and the Web, which is not my cup of tea, are opening new ways and assets that will change the way we do taxonomy as dramatically as Linnaeus did in creating a new starting point. We are bound to come to a time when we will abandon 18th century starting points like 1753 for most plant groups. It will become the obvious and feasible thing to do when we, like Linnaeus, (1) complete a survey of existing names, (2) sort out what names we need and which can be ignored (synonymized), and (3) set up new rules that deal more with the future than the past. This is exactly what the bacteriologists did in creating their new starting point. In fairness, they had a sea change in the defining of their taxa making their old names and types useless.

The lists of names in current use, some available as printed documents since Yokohama, seem to be ignored or reviled. Yet the list of names in current use for extant plant genera (Greuter & al., 1993. NCU-3) is really quite useful. It is a mini-Index Nominum Genericorum but instead of having 68,000 generic names it only has 28,000, highlighting the fact that we have far more synonyms than accepted names ... a past full of redundancy.

Registration is a technique that aims to move the burden of identifying nomenclatural and taxonomic novelties from gleaners combing the literature, in hopes of stumbling on to the novelties, to the authors themselves who, theoretically, are interested in communicating their novelties, not just publishing them. I am convinced that we will come to a time when we will recognize that the effective date of communication of new information is the date of receipt (as can be defined with a registration procedure) rather than the date of mailing.

The BioCode concept is the idea of a unified Code instead of separate ones for zoology, botany, cultivated plants, and bacteriology. This is regarded as an object of fear for reasons that seem obvious to those who are convinced that "my Code is better than your Code". What I see is speciation and it worries me. Even our mycologists are well along in speciating within the Botanical Code. There is at least one fundamental difference between zoological and botanical nomenclature that is nearly irreconcilable: zoologists assign priority to the epithet in a combination but botanists assign priority to the combination. You don't really want me to explain what this means so suffice it to say that this difference is not easy to reconcile. However, the differences in terminology (same term for different things or different terms for the same thing) are philosophically silly. What good is it to have zoologists saying a "valid name" for what botanists call a "correct name", and have botanists saying a "validly published name" for what zoologists call an "available name"?

There are basically two approaches to nomenclature (law). You can design a *Code* that is simple and expect to have a lot of conservation proposals to save names that you really don't want to lose. Alternatively, you can design a *Code* that is complex by adding details that make it possible to avoid disturbing names you don't want to lose and have few conservation proposals. We seem to be approaching the worst of all possible worlds, a *Code* that is amazingly complex and still we need to make hundreds of conservation proposals each year!

I've been around too long and read too many papers by colleagues who said, "be patient, eventually all the name changes buried in post 1753 literature will be made and all will be stabilized." Once more, we looked back to the past at St. Louis. Someday we'll turn around and look to the future. Someday we'll do something that will make it possible to ignore what came before 1953, like Linnaeus who made it possible for us to ignore what came before May 1, 1753, by making it academic. Maybe it is still too early but someday ... someday there will be a new starting point date. To get there it will take an accounting of all names we really are using, although some might feel we have to account for every name that has ever been published.

Enough! I am optimistic and certain that someday we will go into the future facing forward rather than backward.

Proctor

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Islands Botanic Park; he unknowingly saved the life of hereditary Portland Maroon chief Deni Wilson on a storm-tossed ship in the English Channel and was later made an Honorary Maroon of Jamaica; he introduced in 1968 the still-thriving Venus flytrap (*Dionaea muscipula*), from material sent by Marie Wurdack, into a bog in the Mason River Field Station which he founded in Jamaica; and he was friends with the real James Bond (the Philadelphia Academy ornithologist namesake of Ian Fleming's Agent 007) and his wife Mary Wickham Bond as far back as the Catherwood Expedition days. Regarding the abundance of these interesting experiences, Proctor recently told me: "You haven't heard one-tenth of it."

He is presently affiliated with the herbarium in the Department of Life Sciences, University of the West Indies, Mona, Kingston 7, Jamaica, where he will be supervising graduate students and continuing his botanical studies. Notwithstanding his great accomplishments, Proctor believes there is still a need for people to work on various subjects such as the gymnosperms of the Greater Antilles; the higher slopes of the Blue Mountains; the John Crow Mountains (he is the only botanist who has crossed them); and the plants of Trelawny, St. James and Hanover parishes in his beloved Jamaica.

(by Robert DeFilipps)

Shade House

Contractors are in the final stage of building a shade house at the Department of Botany research greenhouse. The structure is made of chain link fence on the sides and the top, with a concrete floor. Plastic privacy strips will be placed in every other link, resulting in 40% shade. Shade cloth from the old roof-top greenhouse will be used in areas for plants that require additional shade. This new addition will increase the available growing space by 3,000 square feet under shade in the summer.

Half of the shade house will contain benches for growing plants in small pots. The other half will be used for larger containers. An additional 2,000 square feet is fenced and can be used to grow sun-loving plants, also during the summer. Raised beds will be installed in part of this area for planting directly in the ground and the rest will be graveled for potted plants. The resulting ability to move plants outside to a protected area will increase their quality, therefore increasing the number of plants that will flower for the first time.

(by Mike Bordelon)

Awards

On August 11 the International Aroid Society (IAS) presented the first H.W. Schott Award for Excellence in Aroid Research to **Dan H. Nicolson** during the 8th International Aroid Conference held at the Missouri Botanical Garden, St. Louis. The award was announced by Thomas B. Croat (MO) and presented by IAS President, Dewey Fisk.

Alice Tangerini received a "1999 Distinguished Service Award" from the Guild of Natural Science Illustrators at their annual meeting held in Richland, Washington in August. This was presented "in recognition of her outstanding volunteer service," including organizing the first annual guild meeting and serving on the planning committee for the two annual meetings held in Washington, D.C. in 1986 and 1996.

Tribute to Lyman B. Smith

The September 1999 issue of *Harvard Papers in Botany* Vol. 4 (1) is largely devoted to a festschrift in honor of former curator Lyman B. Smith, under the title: *Florilegium Luctatori Botanico Dedicatum* - A Tribute to Lyman B. Smith (1904-1977). Jason R.Grant is the tribute organizer and associate editor.The drawing of *Lymania smithii* (see page 12) is featured on the cover. The tribute contains a brief memoir by Lyman's son David (pp. 84-87). A biographical article by **Stephen Smith**, museum specialist in the department, appeared in *Taxon* 46: 819-824 (1997).

Articles in the tribute contributed by department staff are:

DeFilipps, R.A. and B.J. Wolpert. A selected bibliography of Brazilian botanical and environmental considerations (to the year 1992): 241-251;

Dorr, L.J. Notes on *Begonia* (Begoniaceae) in the Venezuelan Andes: 253-264, A new name in *Begonia* (Begoniaceae) from China: 265;

Goldberg A. Memories concerning Lyman Bradford Smith: 95-96;

Robinson, H. and D.C. Taylor. The status of the Pitcairnioid genera of the Bromeliaceae: 195-202;

Strong, M.T. *Schoenus lymansmithii* (Cyperaceae), a new species of *Schoenus* Section *Helothrix* from Santa Catarina, Brazil: 275-277;

Tangerini, A.L. I go to Washington to meet Dr. Smith: 97-102;

Taylor, D.C. and **H. Robinson**. A rejection of *Pepinia* (Bromeliaceae: Pitcairnioideae) and taxonomic revisions: 203-217; and

Wasshausen, D.C. The genus *Stenostephanus* (Acanthaceae) in Bolivia: 279-288.

Coming Event

On **November 5**, a gathering to commemorate the publication of the tribute to Lyman B. Smith will be held in the Department of Botany.

XVI International Botanical Congress

At the IAPT nomenclature section meetings (July 26-30) preceding the Congress itself, on July 29 **D. H. Nicolson**, as chairman/secretary of a nine-person nominating committee, presented the roster of nominations for the next rapporteur-general, as well as for officers and members of the eight permanent committees mandated by the Botanical Code. After corrections and changes made from the floor, the slate was elected.

As retiring president of the International Association for Plant Taxonomy (IAPT), Nicolson convened the General Assembly of the membership on July 30 and began by a reading of the names of the more than 150 botanists that died since the last meeting (in Yokohama,1993). After reports from the retiring officers, the newly elected officers were seated. Others in attendance at the nomenclature sessions were **Vicki Funk, Paul Peterson, Dieter Wasshausen, Robert Soreng**, **Ernani Menez, Laurence Dorr,** and **Laurence Skog**.

On August 1, at the formal opening of the 16th International Botanical Congress at the America's Center in St. Louis, Missouri, D.H. Nicolson, a member of the organizing committee for the Congress, dedicated the Congress to the memory of Frans A. Stafleu (1921-1997). In the closing ceremonies on August 7, Nicolson, as past president of IAPT, replaced the new president, Iain Prance, for presentation of the IAPT Engler medals.

In addition to the departmental members who organized symposia, and presented lectures and posters (see below), others in attendance at the scientific sessions were **Paul Peterson, Dieter Wasshausen, Donna Herendeen**, **Ernani Menez, Laurence Skog, Ellen Farr** and **Robert DeFilipps.**

Symposium Organizers:

Elizabeth Zimmer organized, with Y. Qiu, General Symposium 7.4 on "Current perspectives on basal angiosperms: molecular and developmental aspects."

W. John Kress organized, with R. Uma Shaanker, General Symposium 19.8 on "Habitat fragmentation, plant-pollinator interactions, and population genetic structure."

Lecturers:

Demographic variability of an Amazonian herb (*Heliconia acuminata*): influence of habitat fragmentation, by E. M. Brauna and **W.J. Kress**;

Infrageneric classification of *Passiflora*, by **C. Feuillet** and J. MacDougal;

Bottom-up and top-down interactions determine dominances of benthic producers on tropical reefs, by **M.M. Littler** and **D.S. Littler**;

Pollen morphology, exine structure and systematics of Acalyphoideae (Euphorbiaceae), by **J. Nowicke**;

Diversity and origin of the Hawaiian flora, by **W.L. Wagner**;

Exploring lichen symbionts with molecular tools, by **P.T. DePriest**;

The botanical documentary record, by **L.J. Dorr**;

Climate oscillations, ancient habitat fragmentation, and genetic bottlenecks in an arborescent Amazonian herb, by **W.J. Kress** and **P.R. Aldrich**;

Tracheophyte endemism in Puerto Rico and the Greater Antilles, by **P. Acevedo**;

Adaptive radiation and phylogeny of *Cyrtandra* (Gesneriaceae) based on molecular and morphological data, by J. F. Smith, Q. C. B. Cronk, M. Kiehn and **W. Wagner**;

Phylogeny of basal angiosperms: evidence from mitochondrial, chloroplast, and nuclear genomes, phytochemisry, and morphologv, by Y. Qui, J. Lee, F. Bernasconi-Quadroni, D.E. Soltis, P. S. Soltis, M. Zanis, **E.A. Zimmer,** Y. Suh, J.A. Doyle, P.K., Endress, A. Igersheim, W.E. Friedman, S.K. Floyd, O.I. Nandi, and W. Chase;

Phylogenetic relationships and breeding system evolution of Insular Pacific *Pittosporum* (Pittosporaceae), by C. Gemmill, **G. Allan**, **W. Wagner** and **E. Zimmer**.

Poster Presenters:

Associations of planktonic, benthic, and oceanic dinoflagellates, by **M.A. Faust**; Dinoflagellates in the Pelican Cays, Belize, by **M.A. Faust**;

Phylogenetic inferences in the Mutisieae (Asteraceae), by Hyi-Gyug Kim, **V.A. Funk** and **E. Zimmer**;

Comparative floristic diversity of the Iwokrama Reserve, Guyana, by H.D. Clarke, **V. Funk** and **T. Hollowell**;

Past classifications and a new phylogeny of the gingers (Zingiberaceae): a spicy tale of paraphyly, by **W.J. Kress**, **L.M. Prince** and K.J. Williams;

DNA sequence data provide new insight into relationships in the prayer plant family (Marantaceae), by **L.M. Prince**, **W.J. Kress** and H. Kennedy;

Appendages do matter: a preliminary phylogenetic analysis of tribe Globbeae (Zingiberaceae) based upon its sequence data, by K.J. Williams, **W. J. Kress** and P.S. Manos;

Characterization and biogeographic affinities of the red algal genus *Gracilaria* (Gracilariales) in the Gulf of Mexico, by C. F. Gurgel, S. Fredericq and **J. N. Norris**;

Phylogenetic affinities of the Caribbean marine red alga *Flahaultia tegetiformans* W.R. Taylor, by **J.N. Norris**, S. Fredericq and M.H. Hommersand;

Phylogeny of Winteraceae inferred from 26s ribosomal DNA sequences, by Y. Suh and **E.A. Zimmer**;

Phylogenectic relationships of monosulcate angiosperms based on rbcl, atpB, 18S rDNA, and 26S rDNA sequences, by M. J. Zanis, D. E. Soltis, P. S. Soltis, Y. Suh, Y-L. Qui, and **E. A. Zimmer**;

Molecular evidence for the phylogenetic position of *Takhtajania* in the

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Congress

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Winteraceae, by K.G. Karol, Y. Suh, G.E. Schatz and **E.A. Zimmer**.

Activities after the Congress:

At the 8th International Aroid Conference, **D.H. Nicolson** presided over the first session (August 8) and delivered the after-dinner talk on the last night (August 11), after receiving the first H. W. Schott Award for Excellence in Aroid Research. **W. John Kress,** as executive director, presided over the council meeting of the Association for Tropical Biology. **Robert Faden** attended the council meeting of the American Society of Plant Taxonomists, for whom he serves as representative to the AIBS. **Robert DeFilipps**, as editorial assistant, attended a joint editorial committee meeting of the Flora of China.

Collections Meeting at the Smithsonian

The 14th annual meeting of the Society for the Preservation of Natural History Collections (SPNHC) was held at the Smithsonian Institution, June 27-July 2, 1999. The meeting was co-sponsored by the Smithsonian Center for Materials Research and Education (SCMRE) and the National Museum of Natural History (NMNH). Approximately 200 people from the U.S. and nine other countries attended the meeting.

The Department of Botany was represented by **Deborah Bell** and **Linda Hollenberg** (both also on the local organizing committee), **Katherine Rankin** and **Susan Richardson**. Field trips were taken to the Naturalist Center (VA) and National Conservation Training Center (WV), Alexandria Archaeology (VA), and to Calvert County, MD for fossil collecting. Workshops offered were finance and funding, rigging, and carbon dioxide fumigation.

Collections tours (including Botany) were offered by both NMNH and the Museum Support Center (MSC). The Botany greenhouse, plant illustration, dinoflagellates and plant mounting demonstrations were also included in the open house schedule at MSC. The technical sessions included three specialty sections: "Health and Safety in Collections", "Collecting, Preserving and Accessioning Genetic Resources," and "Repatriation of Anthropology Collections."

(by Linda Hollenberg)

Norris

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esis, he then proceeds to assess the significant morphological characters for their bearing on the systematics of the taxa. By that means, an analysis of the developmental sequences , i.e., pre- and post-fertilization events, or the ontogeny of the plant, becomes the basis for elucidating the taxonomy. Thus, the foundation is set in place for ramifying studies of the biodiversity, biogeography, floristics, and ecology of the various tropical and subtropical marine macroalgae.

Utilizing the Johnson-Sea-Link and Makali'i submersibles, which can dive 50-140 meters, has given the opportunity for Norris to obtain some wonderful plants for study, including the new green, jellylike Caribbean genus and species *Verdigellas peltata*; and the new genus and species represented by the intricately reticulated, rose-red Hawaiian *Callidictyon abyssorum* whose body is filled with *Chlamydomonas*-like cells. He is also interested in the practical matter of economically important marine algae, including *Eucheuma* and *Gracilaria* which are used as emulsifying and stabilizing agents in products such as ice cream. Evidence of his interest in economic aspects is his contribution to the California Sea Grant College Program report entitled *Taxonomy of Economic Seaweeds*, 167 pp., edited by I.A. Abbott and J.N. Norris (1985). He has also studied and published on the names used for algae by the Seri Indians of the state of Sonora, Mexico.

Since 71% of the surface of the Earth is covered with water, there is theoretically a great amount of interesting algal material at Norris' disposal on a worldwide basis, though to find it he must wade, swim, or dive, often to great depths. He has been on the trail of algae in every major body of saltwater in the world, except in the immediate surroundings of Australia. Sometimes an underwater collecting trip can involve sustaining a bit of discomfort, as when he was inadvertently dynamited by fishermen in the South China Sea in 1986. His assistant, museum specialist Robert Sims, was fortunately on the scene to provide crucial help.

Norris seems to have been predestined, or perhaps preconditioned, for a career involving outdoor work as an algologist. A native of Santa Barbara, California, where opportunities for swimming, surfing and hiking abound, he took advantage of them at an early age. The University of California at Santa Barbara, from which he received a Ph.D. in 1975, is now the site of one of Norris's current projects, a collaboration with marine pharmacologist Robert Jacobs, for the study of eicosinoids produced by the green *Anadyomene* of Florida. The occurrence of these particular chemicals in an alga is puzzling, as they are

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Norris

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otherwise known only in male mammals. Additionally, in conjunction with the Scripps Institution of Oceanography in San Diego, Norris is collaborating with the acting director, William Fenical, on natural products chemistry research into the species-specific secondary metabolites of the red genus *Laurencia*. Community service is also an important facet of Norris' work, and under the Smithsonian Mentorship Program, he is currently advising high school student Tyler Fox on a project on Galapagos foliose red algae.

As curator of the algae collections of the U.S. National Herbarium, Norris is responsible for the enhancement and maintenance of the largest algae collections of Tropical Western Atlantic (from the Carolinas to Brazil and Caribbean); Pacific Coast (from California to Mexico); and blue-green (Cyanobacteria), in existence. Representing the algal flora of all the seas and oceans, and of many freshwater bodies, and with a combined total of approximately 187,000 accessioned and inventoried herbarium specimens and over 61,000 algae on microscope slides or liquid-preserved, the department is home to one of the three largest accumulations of algae in the world. Nearly 5,000 type specimens are included. This great assemblage will soon be augmented by the Walter Adey collection of approximately 150,000 specimens of coralline algae. The algae website, developed largely by Robert Sims, may be visited at: http://www.nmnh.si.edu/botany/projects/algae/Alg-Coll.htm.

New on the Web

The Department of Botany's Web site has a new database. **Ellen Farr**, Beatrice Wilde Hale, and **Paula DePriest** have completed and posted "Parmeliaceae: A Searchable List of Names in the Parmelioid Genera (Lichens)." The database is an updated and Internet-accessible form of an electronic database originally developed in the late 1980s by Smithsonian lichen curator Mason E. Hale, Jr. (1928-1990). Volunteer Beatrice W. Hale spent over five years editing and updating the list - adding new and omitted epithets, correcting spellings, and modernizing the classification - and recently published it with co-author DePriest (*Bryologist* 102: 462-544. 1999).

The new database structure, set up by Farr in Microsoft Access with an elegant Web interface developed using Cold Fusion, allows searches by genus name or species epithet, provides accepted names, and generates lists of synonyms. The goal of the database project was to provide a convenient reference for locating the accepted genus among 35 recent generic segregates of *Parmelia* s. lat. with over 2,500 species epithets. Already the database has proved a valuable tool for locating species and specimens among various classification schemes in publications and in the U.S. National Herbarium. Visit the Department of Botany's home page (http://www.nmnh.si/botany) and look in the "Research" section or under "Lichens"in the site index.

(by Paula DePriest)

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Aymard C., G., **L.J. Dorr** and N. Cuello. 1999. *Rudgea tayloriae* (Rubiaceae), an unusual new species from the eastern slopes of the Venezuelan Andes. *Novon* 9(3): 315-317.

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Art by Alice Tangerini

Lymania smithii R.E.Reed was published as a new species in honor of Lyman Smith in the *J.of the Bromeliad Soc.* 34(5): 213 in 1984. The drawing was not made until after the publication came out and was for a proposed treatment of the genus. Robert Read furnished living material of this Brazilian plant and photographs for the illustration. Alice made a watercolor painting later as a commission by a relative of Lyman Smith's.